

THE VALUE PRICING TOLL PROGRAM AT THE PORT AUTHORITY OF NEW YORK & NEW JERSEY: REVENUE FOR TRANSPORTATION INVESTMENT AND INCENTIVES FOR TRAFFIC MANAGEMENT

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ABSTRACT:

The Port Authority of New York and New Jersey's Value Toll Pricing Program was introduced at the six tunnels and bridges that connect New Jersey with New York City on March 25, 2001. Since that time, the program has generated incremental revenue to support an aggressive intermodal capital investment program, and has also produced traffic management benefits to address congestion. The Port Authority's Value Pricing Toll Program represents one the most aggressive applications of value pricing on existing toll facilities in the U.S. Given the level of congestion experienced in the New York-New Jersey region on a daily basis, the program has generated meaningful steps in addressing traffic congestion through market incentives. This paper discusses the genesis of the program as a revenue enhancement to finance an aggressive new intermodal capital investment program. The paper then explores the traffic management benefits of the program, as well as its effectiveness in addressing five key policy objectives established for the effort.

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The Port Authority of New York and New Jersey's Value Pricing Toll Program was introduced at the six tunnel and bridges that connect New Jersey with New York City on March 25, 2001. Since that time, the program has generated incremental revenue to support an aggressive intermodal capital investment program, and has also produced traffic management benefits to address congestion. The toll program discussed in this paper applies to the George Washington Bridge, Lincoln Tunnel, Holland Tunnel, Bayonne Bridge, Goethals Bridge and Outerbridge Crossing.

The Port Authority's Value Pricing Toll Program represents one of the most aggressive applications of value pricing on existing toll facilities in the United States. Given the increasing level of congestion experienced in the New York-New Jersey region on a daily basis, the program has generated meaningful steps in addressing traffic congestion through price incentives. While it is only a first step in creating market signals to manage transportation demand, establishing refinements to the program that are effective and locally acceptable will require continued time and effort to communicate benefits and increase public acceptance.

The Port Authority also recognizes that roadway pricing is only one piece of the larger solution to addressing congestion in the New York-New Jersey region. Roadway pricing is one tool to improve mobility through a corridor-wide management orientation that must be accompanied by coordinated operational solutions, planning, and capital investments among the transportation agencies in the region.

The Port Authority is an organization that is truly intermodal and regional in orientation. In addition to the six tunnels and bridges, the Port Authority operates and maintains, three bus terminals, the PATH rapid transit system, the bistate area's major airports, and major marine terminals in New York and New Jersey. As a financially self-supporting organization, the Port Authority does not receive tax revenue from any state or local jurisdiction and has no power to tax. The agency relies on the revenue generated from facility user fees to cover the operations, maintenance and capital investment needs of its facilities.

CONGESTION: A SENSE OF URGENCY

Congestion will truly challenge the future prosperity of the New York-New Jersey region. The Port Authority recognizes a critical need for mobility investments to address congestion and support economic competitiveness and quality of life. The extreme degree of regional traffic congestion in the New York-New Jersey region has created a sense of urgency for addressing the situation.

The Texas Transportation Institute's "Urban Mobility Report" estimates the cost of traffic congestion in the New York-New Jersey region to be nearly \$10 billion. Given that the peak volumes at many of our interstate transportation links are currently exceeding their capacity, it is projected that the hours of delay could increase by 60% over the next 20 years without a proactive program to find innovative solutions to this problem. If not addressed in meaningful ways, this situation will impact the economic competitiveness and quality of life in the New York/New Jersey region, while also contributing to concerns about air quality and goods movement in the region.

In 2000, the Port Authority launched an historic capital investment program, with \$14 billion in projects identified over the coming five years. At our gateway facilities, the program focuses on airport system revitalization and deep-water port capability. At our interstate transportation facilities, the program is designed to stretch and preserve capacity, and enhance reliability and efficiency through new technology, selected capacity expansion, asset replacement and state-of-good-repair projects. On a regional level, the Port Authority is working with its partners to plan a new commuter rail tunnel from New Jersey to midtown Manhattan, as well as to make the line-haul and terminal improvements required to support this new capacity.

THE OBJECTIVES OF THE VALUE PRICING TOLL PROGRAM

The primary goal of the Value Pricing Toll Program was to generate the incremental revenue required to support the level of capital investment identified. From the mid 1980s through 2000, the net income from tunnel and bridge operations was not sufficient to cover the deficits produced by the PATH system and the bus terminals. The financial forecasts for all the interstate transportation facilities collectively indicated that the debt service and amortization of new capital programs would increase the network deficit exponentially, in the absence of enhanced revenues. Accordingly, the principal objective of the new toll program was to advance a package of toll pricing and PATH fares that would ensure the financial self-sufficiency of the interstate transportation network. However, a toll change also presented an opportunity to progress certain policy objectives as well.

The policy objectives established for the program are:

(1) Encourage Shifts to Less Congested Off-Peak Travel Periods -

The objective here is to shift some peak-period travel demand to the less congested shoulder hours of the peak. While large-scale shifts were not expected, prior Port Authority research had indicated that marginal shifts in travel demand could generate meaningful corridor and system-wide benefits in travel time and overall throughput. Public communications to large employers and media messages stressed the value of flexible working hours in helping to accommodate more effective commutation and allowing employees to take advantage of toll discounts.

(2) Increase the E-ZPass Electronic Toll Collection Market Share -

The pricing program seeks to encourage the greatest use of the E-ZPass electronic toll collection (ETC) payment option, which is a requirement for eligibility for off-peak and other discounts. This will ensure the greatest improvement of traffic flow and ensuring the best transaction times possible through the toll plazas. Most importantly, as the ETC market share increases, the Port Authority will introduce free-flow toll plaza designs that eliminate the toll barriers and allow higher speed toll processing. In the long run, more E-ZPass transactions will also allow more flexibility in dedicating approach roadways for vehicles with non-stop toll transactions.

(3) Encourage Use of Mass Transit in Corridors with Transit Alternatives -

This objective addresses the need to have pricing structures that encourage the use of mass transit to the greatest extent possible. The initial toll proposal differentiated pricing in transportation corridors with mass transit alternatives, to encourage the use mass transit, while recognizing that not all transportation corridors have the same level of transit alternatives available. In responding to input from elected officials and public hearings, a uniform toll structure was adopted in the final analysis. The only corridor differentiation that remained in the approved toll pricing structure was a continuation of a commuter toll program for Staten Island residents, where transit options are minimal.

(4) Create Commercial Traffic Management Incentives -

While delivery schedules often dictate the times that trucks travel over the bridges and tunnels, a toll structure that varies by time-of-day provides the opportunity to create a financial incentive for trucks with the flexibility to travel during the least congested overnight periods.

(5) Eliminate Frequency-Based Commuter Discount Programs -

Another objective was intended to eliminate the high-frequency commuter toll discounts, in order to discourage single-occupant automobile use in the most heavily congested and most costly times of day (i.e., the peak periods). During peak commuter hours, when roadway capacity is scarcest, pricing should be at premium. A Staten Island commuter discount remains in the approved structure to recognize the limited transportation alternatives available to those customers.

THE NEW TOLL PRICING APPROACH

Prior to the implementation of the Value Pricing Toll Program in 2001, the Port Authority's toll structure had not changed for a decade. Tolls are collected in the eastbound (New York-bound) direction only. The previous cash toll rates were \$4.00 for passenger vehicles, \$4.00 per axle for trucks, and \$3.00 for buses and motorcycles. E-ZPass electronic transactions were discounted by 10%. In addition, deep discounts were available to pre-registered E-ZPass private account holders that pre-paid for 20 trips to be used over 35 days. These frequency discounts applied to users of all four bridges at a 25% discount (\$3.00/trip), and for users of the three Staten Island Bridges only at a 50% discount (\$2.00/trip). A carpool toll of \$0.50 was available to passenger vehicles with specially-registered E-ZPass accounts and a minimum of three occupants. (See Table 1 and Table 2).

The new toll pricing approach is based on a high cash toll at all times aimed at increasing E-ZPass enrollment. A deep E-ZPass discount is available for passenger vehicles in off-peak periods, while a modest E-ZPass discount is available during peak periods. The peak periods are weekdays from 6 - 9 a.m. and 4 - 7 p.m., as well as weekends from 12 Noon - 8 p.m. For trucks, there is a modest mid-day and evening discount, as well as a deep discount for truck trips in the weekday overnight period between Midnight and 6 a.m.

THE EXPERIENCE TO DATE

The Value Pricing Toll Program has been successful in accomplishing its revenue objective in support of the capital investment plan, and has also proven to be a success helping to manage traffic congestion at the Port Authority crossings. The following section provides some measures of the effectiveness of the program.

Revenue Generation

The incremental revenue goal established to sustain the \$14 billion in projects planned in the Port Authority's five-year capital investment plan totaled \$150 million annually. A number of toll pricing scenarios were tested using a basic revenue model to assess each scenario's ability to generate new revenue. The evaluation process narrowed the number of scenarios to be considered and provided a consistent basis of evaluation among scenarios.

The model that was employed to estimate the revenue-generating capability of each scenario was based on price elasticities derived from stated-preference survey research conducted in the mid-1990s. The model estimated E-ZPass participation rates based upon the price trade-off decisions indicated from this research. As a consequence, the evaluation tool estimated a 4% higher shift into the E-ZPass payment method than what was actually experienced. With fewer customers than expected using the discounted E-ZPass method of payment, the Port Authority realized a higher average toll, and incremental revenue, resulting from more non-discounted cash transactions.

The financial benefit of these circumstances from the period of April to August 2001 helped to offset the severe revenue losses that were associated with the facility closures, operating restrictions and disruption of normal travel patterns that followed the September 11, 2001 terrorist attacks at the World Trade Center.

We have currently upgraded our revenue-forecasting tool to better predict E-ZPass usage and traffic trends based on econometric methods. This new model will allow us to predict revenue more accurately.

Encourage Shifts to Less Congested Off-Peak Travel Periods

The greatest success in traffic management is evident in the shift in weekday morning traffic demand evident in the hour before the peak toll rates become effective on weekday mornings. The graph below depicts the hourly distribution of vehicular demand for the five-hour period from 5-10 a.m. from 2000 (prior to the toll change), 2001 (immediately after the toll change), and 2002 and 2003 (one and two years after the toll change). (See Figure 1.) These data exclude Holland Tunnel traffic because a ban of single-occupant autos has been in effect since September 11, 2001. The distribution of morning 5-10 a.m. peak-period traffic that arrives in the first hour (5-6 a.m.) shows growth over time, indicating the propensity of customers to travel earlier on weekday mornings to take advantage of the toll discount and avoid congested travel conditions. This percentage grew by 1.3% in the months immediately following the toll change, and by an additional 0.9% after the first year of the value pricing program. This represented a 21% (2,100 vehicle) growth in that first hour. The benefit of this traffic shift has been improved travel times and an earlier end to the morning peak by as much as 20-30 minutes at certain facilities.

It is interesting to note that in 2003, overall traffic volumes at the Port Authority crossings have been reduced because of the downturn of the regional economy. As a consequence, there has been some back-shift of the early morning shoulder-hour demand, into the now, less-congested, 6-9 a.m. peak period. The percentage share of total 5-10 a.m. hour traffic arriving in the first hour in 2003 has fallen 0.5% from the prior year's level. The lesson appears to be that a \$1.00 differential between peak and off-peak toll rates has produced some meaningful shift of a.m. peak-period to an earlier hour, but these shifts are highly correlated to the overall level of congestion experienced in the peak hours.

This observation is supported by the data shown in Figure 2, which indicate that from 2002 to 2003, 5-6 a.m. traffic volume declined by 9.0% (1074 vehicles), while 6-7 a.m. traffic volumes fell by 5.7% (1259 vehicles).

The program has been less successful in shifting travel demand to later hours of the morning peak period. The initial experience of the program suggests that customers have neither the flexibility nor desire to travel later on the morning weekdays with a \$1.00 price incentive. Behavioral research underway will help to ascertain customer perceptions and choices more definitively.

In the p.m. peak the results are less definitive. (See Figure 3). The evening traffic experience mirrors the results evident in the morning with motorists more able and/or willing to travel before the afternoon peak period than they are after the peak hours. However, the results are very modest and not statistically significant. The weekend travel patterns hold no significant difference in travel demand by time of day around the peak pricing hours, suggesting that the nature of this demand is relatively inelastic with a \$1.00 incremental price differential. The lesson learned from this experience is that the more discretionary nature of evening and weekend travel into New York City may be more inelastic than originally expected. The diminished level of transit service, in terms of frequency and availability, later in the evenings and on the weekends may contribute to the lack of more favorable results in encouraging new travel time shifts in these periods.

Increased E-ZPass Market Share

The pricing incentive for E-ZPass electronic toll users embodied in the Value Pricing Toll Program was successful in increasing E-ZPass market share. This incentive varies from a \$1 to \$2 discount for automobile drivers using E-ZPass over the cash-payment method depending on the time of day. In the months prior to, and just after, implementation of the new toll structure, there was a surge of 5.1 percentage points in automobile E-ZPass usage, rising from 60.4% in January 2001 to 65.5% in May 2001. (See Figure 4). Since that time E-ZPass use for auto customers has climbed an additional 3.6 percentage points to a high of 69.1% in March 2003, marking a total gain of 8.7 percentage points. While the Value Pricing Toll Program has played a large role in driving the gains in E-ZPass market share, other factors have contributed to the trends as well. In particular,

with the downturn in economic conditions, overall traffic volumes have declined. However, more cash-paying customers (who tend to be more discretionary and low-frequency users) have been lost than E-ZPass customers, which tends to drive the overall market share upward.

E-ZPass usage by truck customers increased by 7.7 percentage points from January 2001 to March 2003 (57.2% to 64.9%), somewhat less than the increase for auto users. This difference maybe partly attributed to a lack of knowledge about the pricing benefits of E-ZPass on the part of a number of trucking outfits and reluctance on their part to pre-pay tolls, a requirement of the E-ZPass program. Nonetheless, the incentives have proven a viable means to influence choice of payment methods at the Port Authority crossings.

THE PROMISE FOR THE FUTURE

The dire need for new transportation revenue sources and creative means to address traffic congestion suggest that value pricing is a concept whose time has come. Yet establishing programs that are effective and locally acceptable requires continued time and resources to expand understand and acceptance. In the New York-New Jersey region, the number of existing tolled facilities suggests a tremendous potential to realize additional benefits through coordination of peak-pricing schedules with neighboring toll agencies. With more than 8 million electronic toll collection tags in the New York-New Jersey metropolitan area, opportunities also exist for coordinated customer services at the E-ZPass Customer Service Centers in the region that may encourage behavioral change and greater effectiveness of individual programs to achieve meaningful congestion benefits.

In the New York-New Jersey region, Federal Highway Administration funding is being used to evaluate and communicate the benefits and lessons learned of value pricing, as well as to suggest refinements to the program and encourage consideration of similar projects elsewhere in the region.

The promise for value pricing in the years ahead is to realize fully the dual objectives of congestion management and revenue generation. New pricing projects throughout the U.S. are embracing a broader transportation improvement agenda, including transit, which creates new travel options and enhances customer choice.

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LIST OF TABLES AND FIGURES

TABLE 1: PASSENGER VEHICLE TOLL RATES

TABLE 2: COMMERCIAL VEHICLE TOLL RATES

FIGURE 1: HOURLY DISTRIBUTION OF DEMAND AROUND THE AM PEAK

FIGURE 2: WEEKDAY AM TOTAL TRAFFIC DISTRIBUTION

FIGURE 3: HOURLY DISTRIBUTION OF DEMAND AROUND THE PM PEAK

FIGURE 4: INCREASE IN E-ZPASS MARKET SHARE AT PORT AUTHORITY CROSSINGS

TABLE 1: PASSENGER VEHICLE TOLL RATES






			
	Off-Peak Hours	Peak Hours	CASH All Hours
AUTOS	\$4.00	\$5.00	\$6.00
MOTORCYCLES	\$3.00	\$4.00	\$5.00
Discount Programs: <i>(Available all hours with special registration through E-ZPass account)</i>			
Carpool Program:	\$1.00 for registered E-ZPass vehicles with 3 or more people.		
SI Bridges Program:	\$50 for 20 Trips in a 35-day period at the Goethals and Bayonne Bridges and Outerbridge Crossing with E-ZPass.		
Peak Hours:	Weekdays: 6-9 a.m., 4-7 p.m. Sat. & Sun.: 12 Noon-8 p.m.		
Off-Peak Hours:	All Other Times		

TABLE 2: COMMERCIAL VEHICLE TOLL RATES

				
	Off-Peak Hours	Peak Hours	Overnight Hours	CASH All Hours
TRUCKS <i>(per axle)</i>	\$5.00	\$6.00	\$3.50	\$6.00
BUSES	\$2.70	\$2.70	\$2.70	\$3.00
Truck Overnight Hours:	Midnight to 6 a.m. weekdays.			
Peak Hours:	Weekdays: 6-9 a.m., 4-7 p.m. Sat. & Sun.: 12 Noon-8 p.m.			
Off-Peak Hours:	All Other Times			

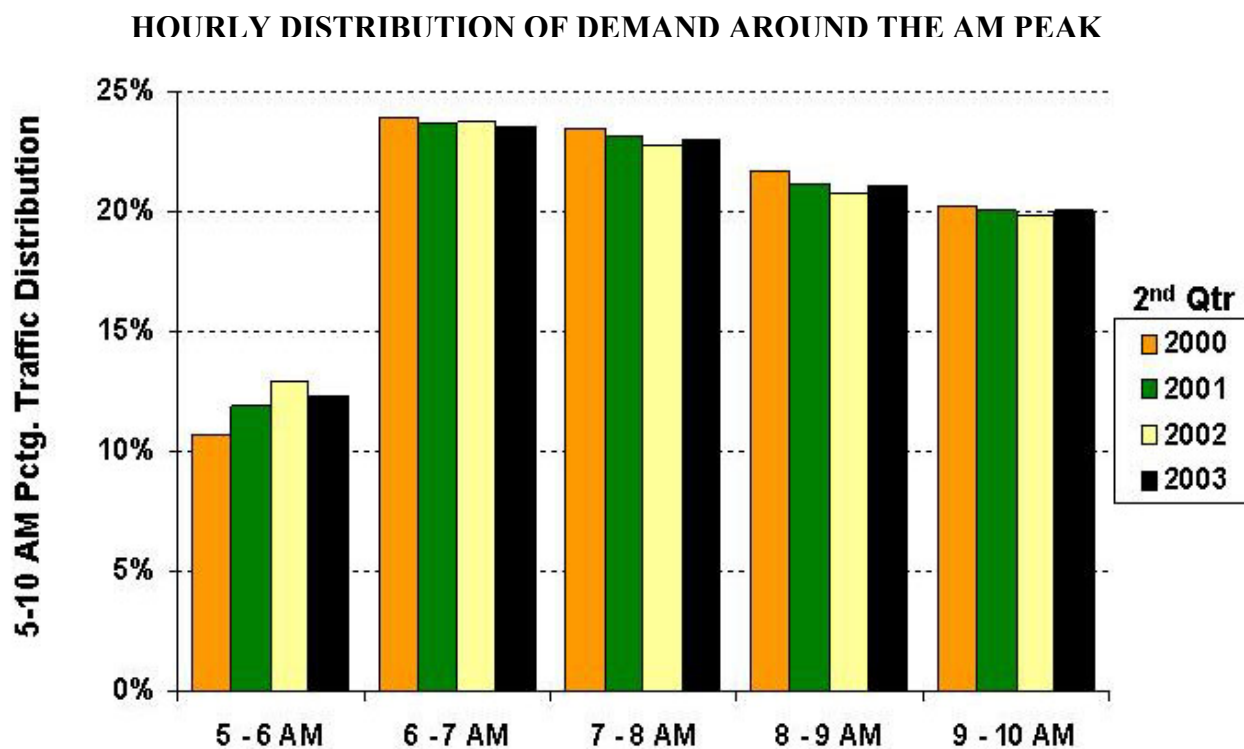


FIGURE 1

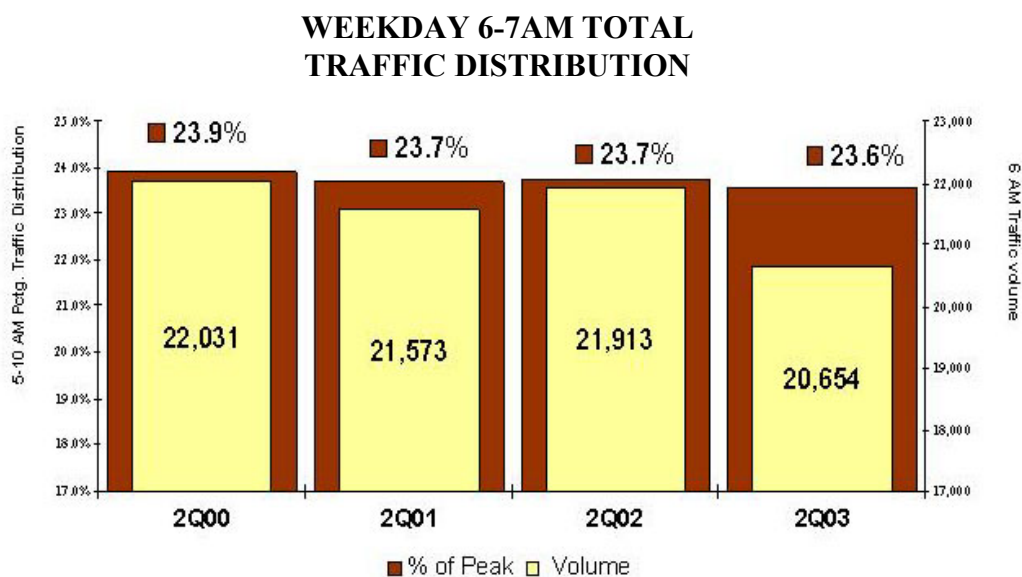
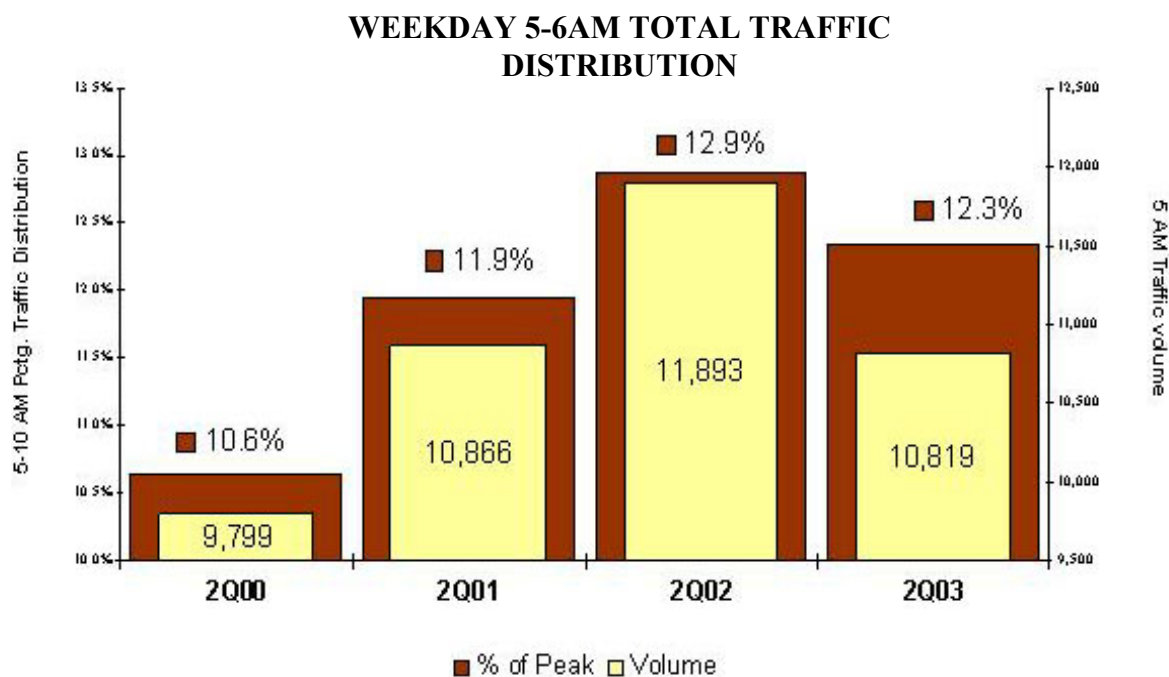


FIGURE 2

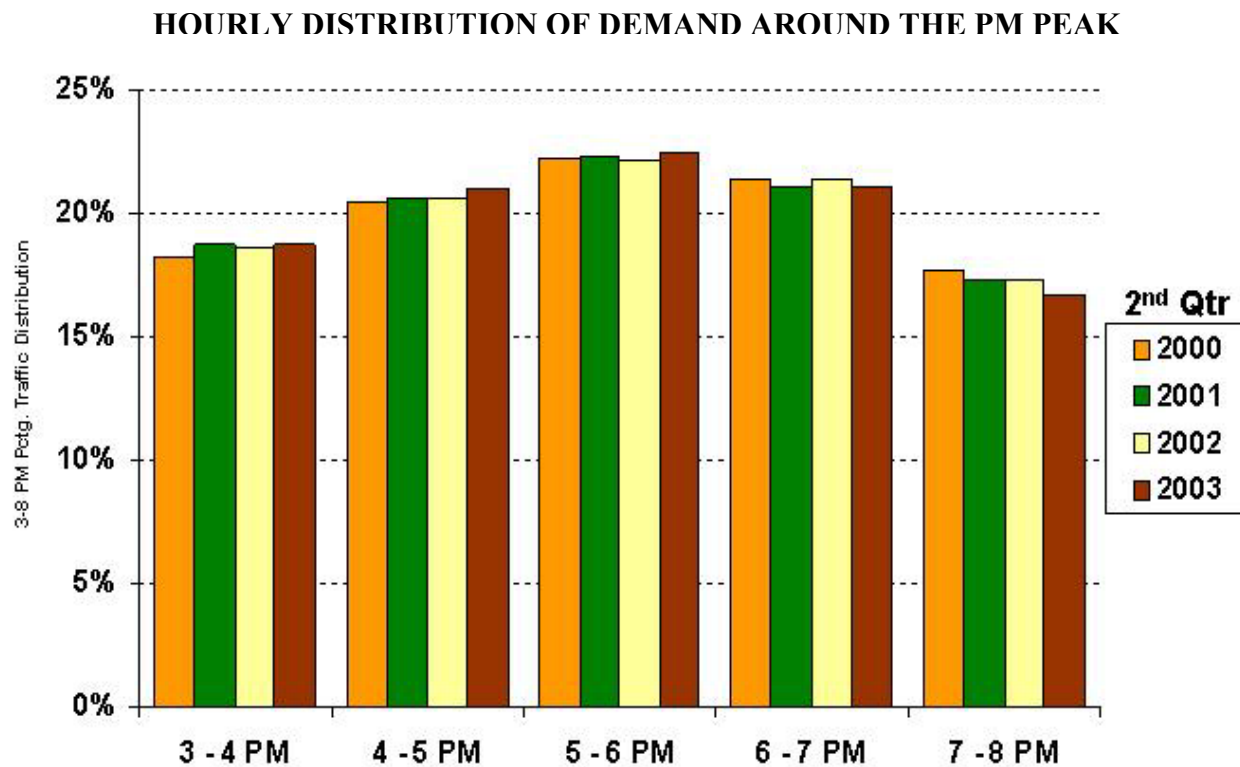


FIGURE 3

INCREASE IN E-ZPASS MARKET SHARE AT PORT AUTHORITY CROSSINGS

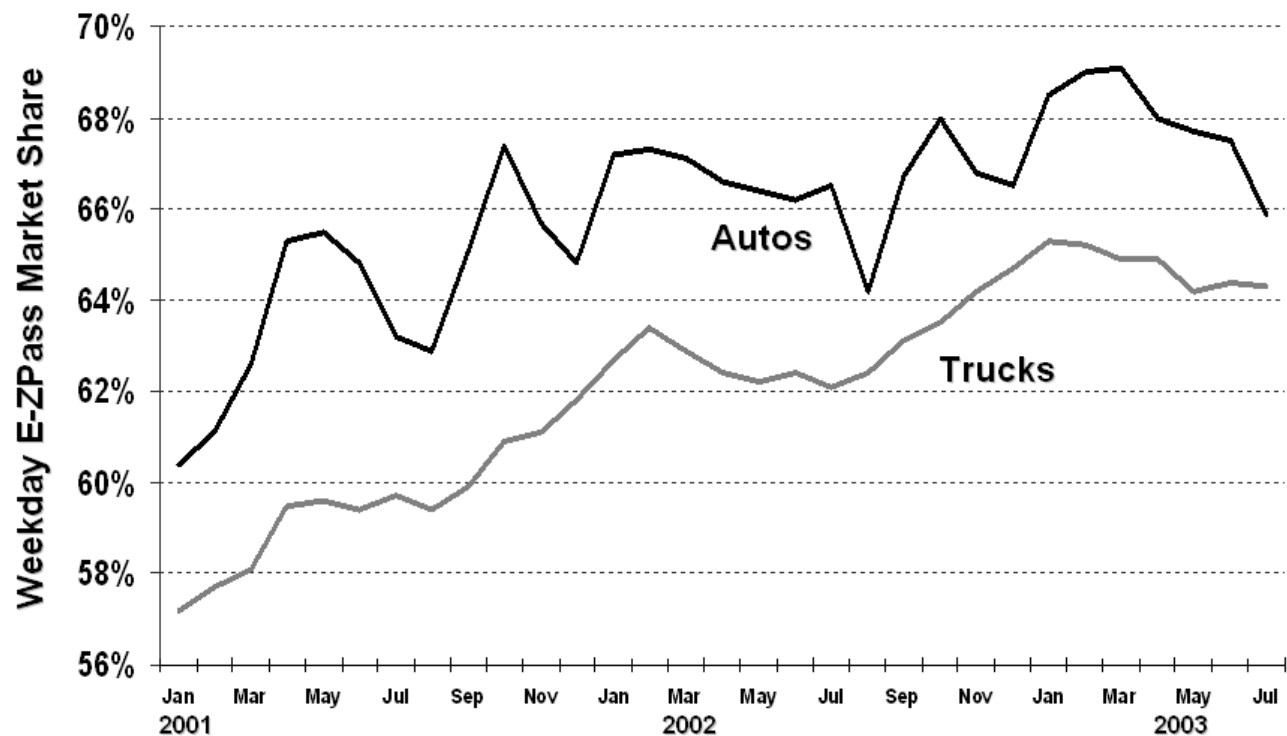


FIGURE 4